

REMARKS

Claims 1-14 are currently pending in the application, with claims 5, 6, and 12-14 being withdrawn from consideration by the Examiner. By this response, no claims are amended, added, or canceled. Applicants appreciate the Examiner's reconsideration and withdrawal of the previous objection to the specification and rejections under 35 U.S.C. §112, first and second paragraphs. However, Applicants submit that all of the claims are in condition for allowance for the following reasons, and request further reconsideration of the rejected claims in view of the following remarks.

35 U.S.C. §101 Rejection

Claims 1-4 and 7-11 are rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter. This rejection is respectfully traversed.

The Examiner asserts that "the claimed method is nothing more than a series of mathematical and/or computer-based matrix operations without finally getting around to operating the nozzles using the recited method ... which would then be seen as having a useful and tangible concrete result" (Final Office Action, page 2). The Examiner further asserts that the claims "[do] not seem to implement the results of the control method in any manner (i.e., applying the control solution to the recited nozzle matrix to effect the desired torque/force results of a vehicle), so as to provide a recognizable useful concrete and tangible end result" (Final Office Action, page 4). Moreover, in the Response to Arguments section, the Examiner further states "Applicant does not meet the last criterion of having a concrete result because the method claims do not actually recite the use of the end result of the mathematical processing to perform

the optimum fuel control of nozzles” (Final Office Action, page 4). Applicants respectfully disagree with these assertions, and submit that the claims are directed to statutory subject matter.

According to MPEP §2106, to properly determine whether a claimed invention complies with the statutory invention requirements of 35 U.S.C. §101, it must first be determined whether the claim falls within at least one of the four enumerated categories of patentable subject matter recited in section 101 (i.e., process, machine, manufacture, or composition of matter).

Applicants respectfully submit that the claimed invention is directed to a process, and, therefore, falls within one of the four enumerated categories.

Merely determining whether a claim falls within one of the four enumerated categories of patentable subject matter recited in 35 U.S.C. §101 (i.e., process, machine, manufacture, or composition of matter) does not end the analysis because claims directed to nothing more than abstract ideas (such as mathematical algorithms), natural phenomena, and laws of nature are not eligible for patent protection. A claim that falls within an enumerated statutory category and does not cover a 35 USC §101 judicial exception (*i.e.*, an abstract idea, natural phenomenon, or law of nature) is clearly directed to statutory subject matter. However, a claim that does include a judicial exception may still be eligible for patent protection if it either: (A) transforms an article or physical object, or (B) produces a useful, concrete, and tangible result. For example, the “application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.” *Diamond v. Diehr*, 450 U.S. 175, 187, 209 USPQ 1, 8 (1981). Applicants respectfully submit that the claimed invention, while admittedly including mathematical operations, comprises a process that produces a useful, concrete, and tangible result, and, therefore, is directed to statutory subject matter.

1. Application of Incorrect Standard by Examiner

The Examiner asserts the claimed invention does not produce a concrete result because the method claims do not actually recite the use of the end result of the mathematical processing to perform the optimal fuel control of nozzles (Final Office Action, page 4). However, Applicants respectfully submit that the Examiner is applying an incorrect standard for determining what constitutes a concrete result. As stated in MPEP §2106, the test for determining a concrete result is whether the process has a result that can be substantially repeatable; the test is not whether the claims recite a use of the result to perform an action or transformation.

By seemingly requiring that the claims recite a use of the end result to perform an action, it appears that the Examiner is confusing the “transforms an article or physical object” analysis with the “produces a useful, concrete, and tangible result” analysis. However, Applicants submit that these two ways of demonstrating a practical application under §101 are mutually exclusive. More particularly, MPEP §2106 states:

For purposes of an eligibility analysis, a physical transformation “is not an invariable requirement, but merely one example of how a mathematical algorithm [or law of nature] may bring about a useful application.” *AT&T*, 172 F.3d at 1358-59, 50 USPQ2d at 1452. If USPTO personnel determine that the claim does not entail the transformation of an article, then USPTO personnel shall review the claim to determine it produces a useful, tangible, and concrete result. In making this determination, the focus is not on whether the steps taken to achieve a particular result are useful, tangible, and concrete, but rather on whether the final result achieved by the claimed invention is “useful, tangible, and concrete.” In other words, the claim must be examined to see if it includes anything more than a 35 U.S.C. 101 judicial exception.

Thus, even if the claimed process does not result in a physical transformation or operation (such as, using an end result to perform an action), the claimed invention may still be

directed to statutory subject matter if *the final result achieved by the claimed invention is useful, tangible, and concrete*. Applicants submit that, for the reasons discussed both below and in the previous response dated October 5, 2006, the present invention produces a result that is indeed useful, tangible, and concrete.

2. Application of Correct Standard

Applicants submit that the claimed invention produces a useful, concrete, and tangible result. More specifically, regarding the useful and tangible prongs of the analysis, Applicants repeat and incorporate by reference the arguments presented on pages 6-8 of the previous response (dated October 5, 2006). Moreover, inasmuch as the rejection in the Final Office Action is limited to the “concrete result” prong of the analysis, Applicants acknowledge the Examiner’s implicit admission that the claimed invention produces both useful and tangible results.

The guidance for the “concrete result” prong of the §101 inquiry is provided by the following passage from MPEP §2106:

Another consideration is whether the invention produces a "concrete" result. Usually, this question arises when a result cannot be assured. In other words, *the process must have a result that can be substantially repeatable or the process must substantially produce the same result again. In re Swartz*, 232 F.3d 862, 864, 56 USPQ2d 1703, 1704 (Fed. Cir. 2000). ... *The opposite of "concrete" is unrepeatable or unpredictable.*

[emphasis added].

Applicants submit that the inventions recited in independent claims 1 and 7 each, as a whole, have substantially reproducible results, such that these claims produce concrete results, as described by the MPEP. That is, claim 1 recites a method for the computer assisted

determination of an optimum fuel-control of nozzles. Furthermore, claim 7 recites a method to obtain optimum fuel usage for nozzles. Even further, the Examiner acknowledges on page 4 of the Office Action that the claimed invention results in a control solution, such that the only question with respect to the concrete result prong is whether the result is substantially repeatable. As previously discussed, the present invention provides an optimum fuel solution that is repeatable for a same given set of input variables. That is, an input of the same variable set will produce the same control solution, time and again, such that the results of this method are repeatable. Therefore, as the processes recited in the claims produce a result that is substantially repeatable, Applicants submit that the claimed invention provides a concrete result in terms of the §101 analysis.

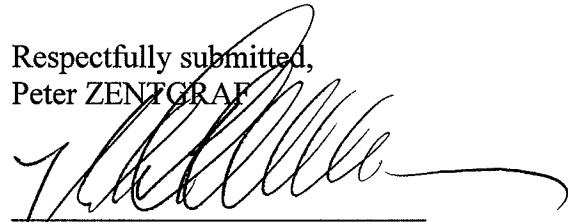
Lastly, it is noted for the record that Applicants do not agree with the Examiner's assertion that the claims are directed to "essentially claiming mathematical algorithms" (Final Office Action, page 4). To the contrary, Applicants submit that, as shown above, the claims are directed to processes that result in a practical application that produces a useful, concrete, and tangible result. As such, the claims are directed to statutory subject matter, and the instant rejection under 35 U.S.C. §101 is improper.

Accordingly, Applicants respectfully request that the rejection over claims 1-4 and 7-11 be withdrawn.

CONCLUSION

In view of the foregoing remarks, Applicants submit that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed. Applicants hereby make a written conditional petition for extension of time, if required. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 19-0089.

Respectfully submitted,
Peter ZENTGRAF



Neil F. Greenblum
Reg. No. 28,394

Robert W. Mueller
Reg. No. 35,043

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GREENBLUM & BERNSTEIN, P.L.C.
1950 Roland Clarke Place
Reston, VA 20191
(703) 716-1191